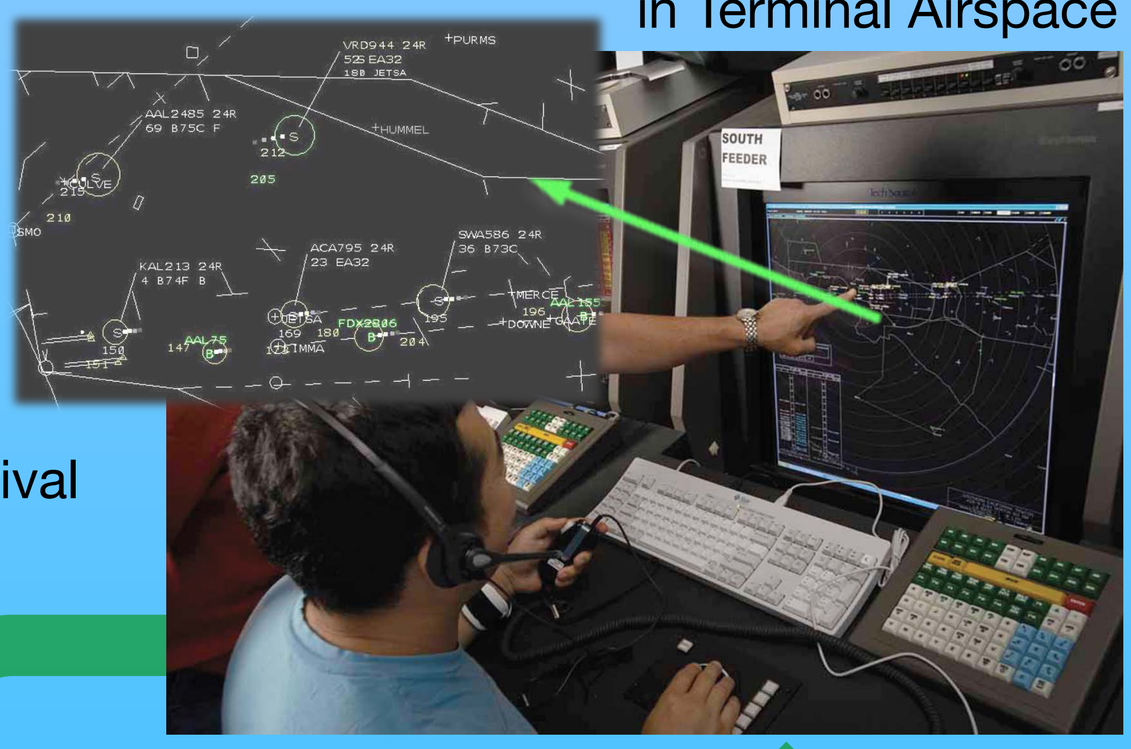
https://ntrs.nasa.gov/search.jsp?R=20160000430 2019-08-31T04:51:19+00:00Z

National Aeronautics and Space Administration

ATD-1:
ATM Technology Demonstration 1

Flight Deck Interval Management Display

Controller Managed Spacing Tools in Terminal Airspace



Integrated Arrival Solution

Terminal Area Precision Schedule

Enabling efficient arrivals for the **NextGen** Air Traffic Management System

www.nasa.gov

National Aeronautics and Space Administration

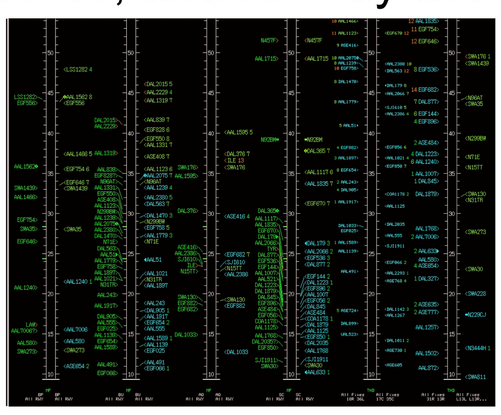
INTEGRATED SCHEDULING AND SPACING

What is the problem?
The air traffic controller's role is to keep aircraft separated, maintain throughput, and provide efficient flight paths. When traffic demand, and the corresponding cognitive workload, is high, human controllers shift their focus to maintaining throughput and safety, rather than towards providing the most efficient flight paths.

What is the solution?
NASA is developing a set of integrated decision support tools to reduce the high cognitive workload so that controllers are able to simultaneously achieve safe, efficient, and expedient operations at high traffic demand levels.

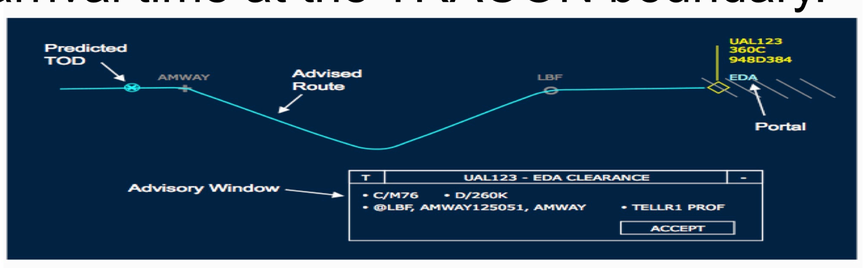
Required Navigation Performance/Area Navigation (RNP/RNAV) allows more fuel-efficient routing options.

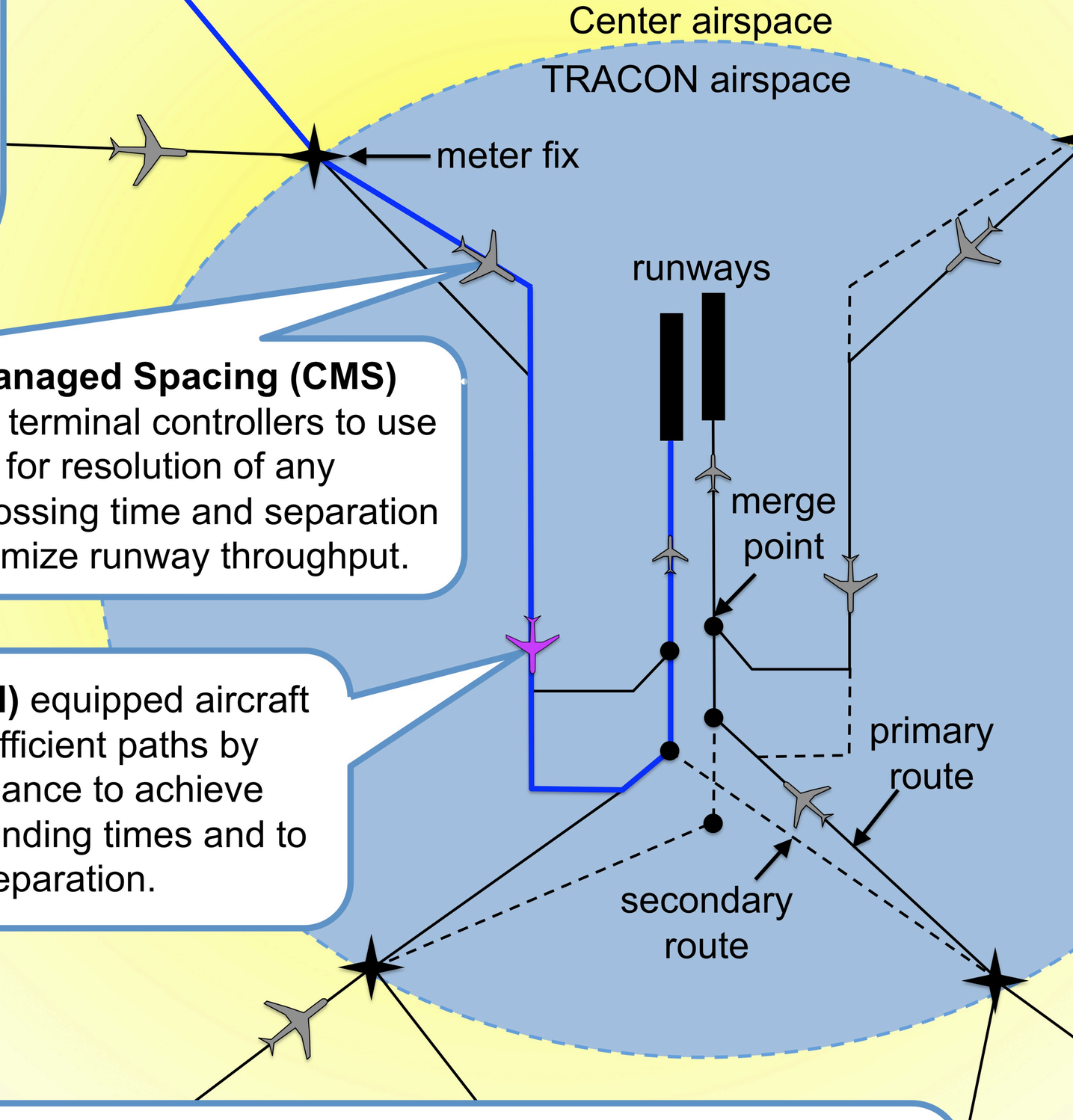
Advanced Traffic Management Advisor (TMA) precision time-based scheduling enhancements provide efficient arrival routes, and runway assignments,

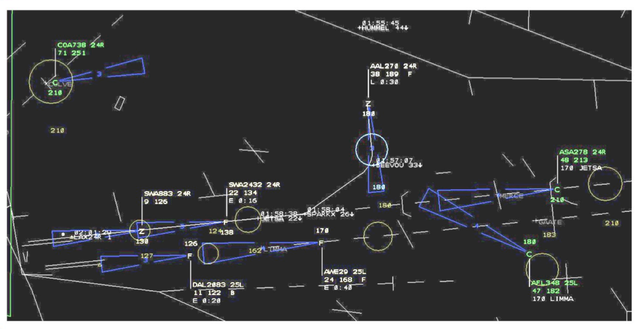


terminal merge sequences, crossing times and separation constraints for all aircraft.

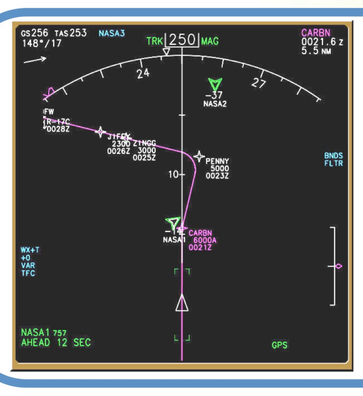
Efficient Decent Advisor (EDA) advises en route controllers of the RNAV route and speed profile needed to execute an Optimal Profile Descent (OPD) that avoids conflicts and satisfies any TMA-scheduled arrival time at the TRACON boundary.





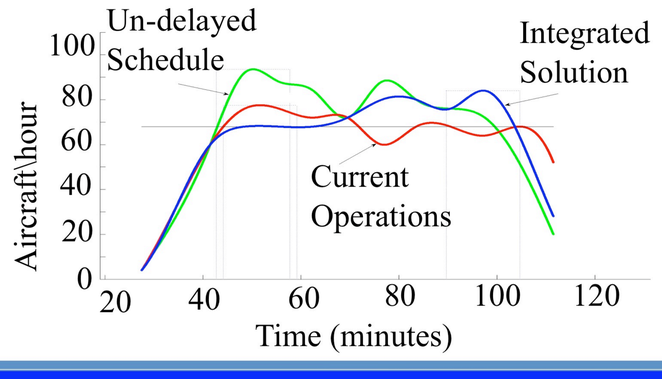


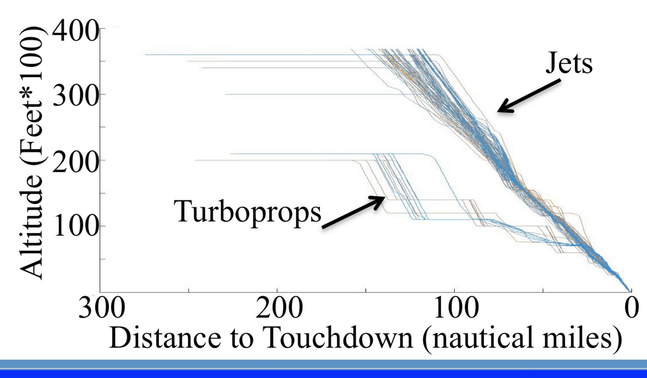
Controller Managed Spacing (CMS) tools facilitate terminal controllers to use speed control for resolution of any residual fix crossing time and separation errors to maximize runway throughput.



Interval Management (IM) equipped aircraft may achieve even more efficient paths by using onboard speed guidance to achieve precise fix crossing and landing times and to maintain required traffic separation.

Integration Results thus far: Advanced TMA, EDA and CMS provide higher sustained throughput with aircraft efficient arrivals from cruise to touchdown during dense terminal operations.





Next step: Field demonstrated integration between Advanced TMA, CMS, and IM.